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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,501	01/25/2002	Leon Chia-Liang Lin	01 P 15965US (INFI 2320)	4345

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EXAMINER	
WONG, WARNER	
ART UNIT	**PAPER NUMBER**
2668	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,501	LIN, LEON CHIA-LIANG	
	Examiner	Art Unit	
	Warner Wong	2668	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *2-5* is/are withdrawn from consideration.

5)☒ Claim(s) *1-19* is/are allowed.

6)☒ Claim(s) *20,21 and 24-26* is/are rejected.

7)☒ Claim(s) *22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim 20 –21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long (6,560,276) in view of van den Elzen (4,117,277).

Long describes a data communication method comprising:

a. receiving elements of a first data sequence (fig. 4, bitstream from the host) at a first rate ([1x] symbol rate sampling before the encoder and transmit engine) controlled by a first clock signal (inherent to first symbol rate sampling) and processing the first data sequence to generate elements of a second data sequence (fig. 4, Rsamples to the host) at a second rate (3x symbol rate) controlled by a second clock signal (inherent to the second rate sampling) wherein the second rate is higher than the first rate (col. 7, lines 7-8, "Symbols from the data encoder are up-sampled to 3x the symbol rate."), wherein the second data sequence is an encoded version of the first data sequence (fig. 4, via data encoder #400);

b. converting the second data sequence (fig. 4, Rsamples to the host) into an analog signal (fig. 1, #170 and col. 4, digital-to analog conversion description in lines

49-55) and transmitting the analog signal via a communication channel (fig. 1, telephone line).

c. receiving and processing the analog signal transmitted by the communication channel (fig. 1, telephone line) to generate elements of a third data sequence (fig. 4, Rsamples from the host) at a third rate (3x symbol rate, as in col. 8, lines 3-4, "The receiver de-modulates the received samples to the base-band (still at 3x symbol rate)".) controlled by a third clock signal (inherent to the third rate sampling);

d. receiving and processing the third data sequence (fig. 4, Rsamples from the host) to generate elements of a fourth data sequence (fig. 4, bitstream to the host) at a fourth rate (inherent that the modem receiving side downsamples to the [1x] sampling rate, a reversed functionality at the transmitting side) controlled by a fourth clock (inherent to the fourth rate sampling), wherein the fourth rate is lower than the third rate (col. 8, lines 3-4, "The receiver de-modulates the received samples to the base-band (still at 3x symbol rate)" and the first and fourth data sequences are substantially similar (same data being upsampled, transmitted, then downsampled in a modem transmission transfer environment, col. 2, 2-4, 10-11).

In view of claim 20, Long lack what Sendonaris describes:

periodically adjusting first/second coefficient values supplied as input to a first /second FIR filter in response to second/third clock signal (fig. 5, #34 frequency output S3 for coefficients adjustments; col. 10, lines 54-61 describing the S3 frequency & col. 11, lines 10-13, describing coefficients being adjusted by S3) for the purpose of achieving a high relative data rate.

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to periodically adjust the filter coefficients using the corresponding coefficient clock signals from the receiving side as in van den Elzen for the method of Long. The motivation being that such design yields/achieves a high relative data rate (van Den Elzen, col. 3, lines, 13 & 32-39).

Regarding claim 21, Long and van den Elzen combined describes all limitations as set forth in claim 20. Long further describes:

e. deriving the first clock signal from the second clock signal (col. 7, lines 7-8, "Symbols from the data encoder are up-sampled to 3x the symbol rate", where it is interpreted that the internal clock which creates 3x symbol rate also derives the 1x symbol rate).

f. deriving the fourth clock signal (remote's final signals at 1x symbol rate) from the third clock signal (inherent from col. 8, lines 3-4, "The receiver de-modulates the received samples to the base-band [still at 3x symbol rate]".).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long in view of van den Elzen, and further in view of Takano (5,768,281) and Agazzi (6,459,746).

Regarding claim 24, Long and van den Elzen combined describe all limitations as set forth in claim 21.

In view of claim 24, Long and van den Elzen combined lack what Takano describes as substeps:

a1. [at the local transmitter], masking portions of the second clock signal to produce a fifth clock signal (col. 7, lines 61-65).

d1. [at the remote receiver], masking portions of the third clock signal to produce a fifth clock signal (col. 7, lines 61-65) for the purpose of a simpler/more economical clocking design.

It would have been obvious to one in the ordinary skill of art at the time of invention to use clock masking to produce a scaled down input clock signal if needed for claim 1's filter. The motivation is that a clock mask may be simpler and more economical to design & implement than other means (e.g. using a separate oscillator) for producing a scaled down input clock.

In view of claim 24, Long, van den Elsen and Takano lack what Agazzi describes:

a2. [at the local transmitter], shifting elements of the first data sequence (fig. 19, TXD) into a FIFO buffer (fig. 19, FIFO) at a first rate controlled by the first clock signal (fig. 19, GTX_CLK);

d3. [at the remote receiver], shifting elements of the fourth data sequence (fig. 19, output from RX #1922) into a second FIFO buffer (fig. 19, dotted FIFO) at a sixth rate controlled by the sixth clock signal (fig. 19, Rec. Clk or col. 58, line 65), and;

a3. [at the local transmitter], shifting elements of the first data sequence out of the first FIFO buffer (fig. 19, FIFO) at a fifth rate controlled by the fifth clock signal (col. 58, line 60, TCLK);

d4. [at the remote receiver], shifting elements of the fourth data sequence out of the second FIFO buffer (fig. 19, dotted FIFO) at a fourth rate controlled by the fourth clock signal (fig. 19, RX_CLK);

a4. [at the local transmitter], processing the first data sequence as it is shifted out of the first FIFO buffer to generate the elements of the second data sequence at the second rate controlled by the second clock signal (as described in claim 1);

d2. [at the remote receiver], processing the third data sequence to generate the elements of the fourth data sequence at the sixth rate controlled by the sixth clock signal (as described in claim 1). The above functionality is for the purpose of minimizing buffer over/under runs.

It would have been obvious to one in the ordinary skill of art at the time of invention to add a FIFO buffer between the transceiver connection to the terminal device. The motivation being that data (Tx,a/Rx,a) which the upper (MAC) layer sent/received asynchronously to/from the transceiver are often times over/under run and a FIFO is a well-known buffer design used between the transceiver and terminal device to minimize such over/under run (Agazzi, col. 58, lines 60-67 and col. 59, lines 1-

2, "FIFO 1930 is needed for proper transfer of data TXD from MAC.. FIFO 1934 is needed to ensure proper transfer of data RXD 1927 from the receiver 1922 to the MAC.")

Regarding claim 25, Long, van den Elsen, Takano and Agazzi combined describe all limitations as set forth in claim 24. Long further describes:

a41. trellis code modulation encoding the first data sequence (Long, col. 6, lines 32-34) as it is shifted out of the FIFO buffer to generate elements of a fifth data sequence (fig. 4, via the data encoder #400, col. 6, lines 32-34).

a42. applying the fifth data sequence as input to a first (claim 1's local transmitter) filter clocked which interpolates elements of the fifth data sequence to produce elements of the second data sequence at said second rate (via the transmit engine's FIR fiter, col. 7, lines 6-13).

d21. applying the third data sequence as input to a second filter which interpolates elements of the third data sequence to produce elements of a sixth data sequence at said third rate (via the receive engine's FIR filter, col. 8, lines 7-17).

d22. trellis code modulation encoding the sixth data sequence to generate elements of the fourth data sequence at the sixth rate (fig. 4, via the data decoder #430, col. 9, lines 41-42).

Regarding claim 26, Long, van den Elsen, Takano and Agazzi combined describe all limitations as set forth in claim 25.

Van den Elsen further describes that the values of the receiving side (second) coefficients are adjusted in response to the output (sixth) data sequence (fig. 5,

loopback of output from 39 back into the coefficient register 38) for the purpose of achieving a high relative data rate.

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to periodically adjust the filter coefficients using the corresponding coefficient clock signals from the receiving side as in van den Elzen for the method of Long. The motivation being that such design yields/achieves a high relative data rate (van Den Elzen, col. 3, lines, 13 & 32-39).

Allowable Subject Matter

4. Claims 1-19 allowed.

5. Claims 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments with respect to the newly filed claims 20-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Warner Wong whose telephone number is 571-272-8197. The examiner can normally be reached on 5:30AM - 2:00PM, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Warner Wong
Examiner
Art Unit 2668

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